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Marino

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[54] **NECK FINISH FOR A WIDE MOUTH CONTAINER**

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[51] **Int. Cl.**[5] **B65D 41/46**

[52] **U.S. Cl.** **215/256;** 215/253; 215/31; 220/276; 220/306

[58] **Field of Search** 215/256, 253, 321, 31; 220/276, 306, 355

[56] **References Cited**

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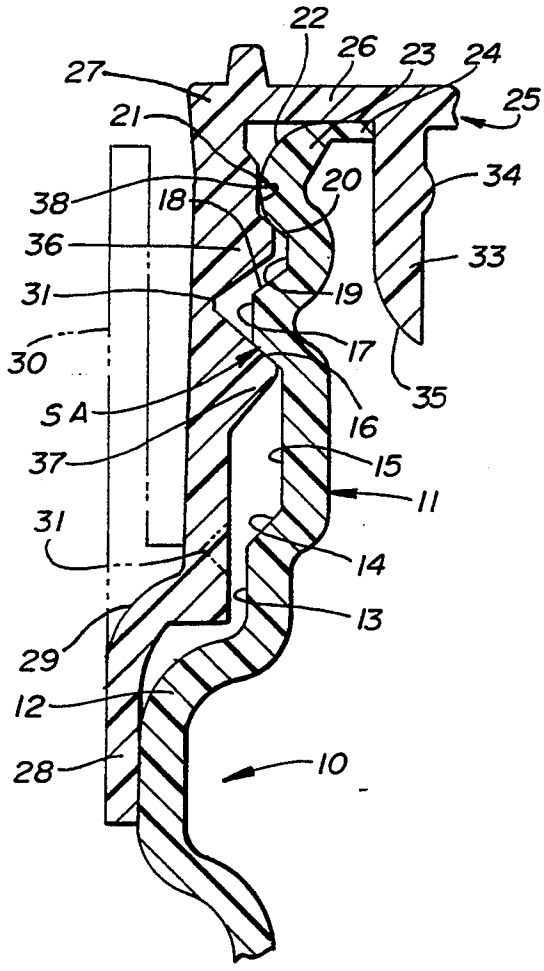
[57] **ABSTRACT**

A neck finish on a wide mouth container to accept a tamper evident cap to provide multiple sealing surfaces therebetween. The neck finish having cooperating upper and lower locking ribs and grooves holding the cap in place until a majority portion of the cap is removed by tearing along a horizontal frangible line, disengaging one of the locking ribs from the neck finish. The neck finish provides multiple sealing surfaces in both vertical and horizontal alignment.

9 Claims, 1 Drawing Sheet



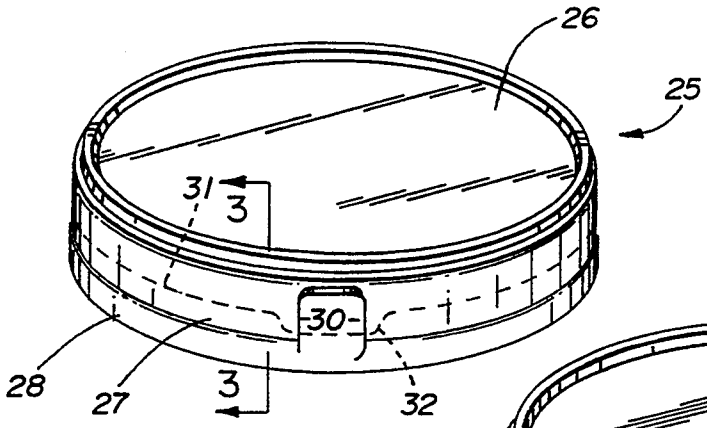


FIG. 1

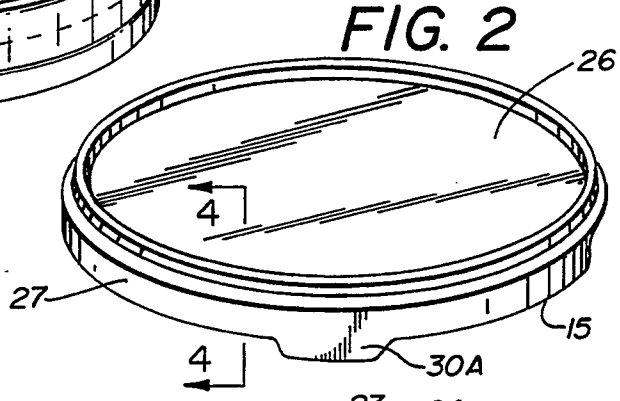


FIG. 2

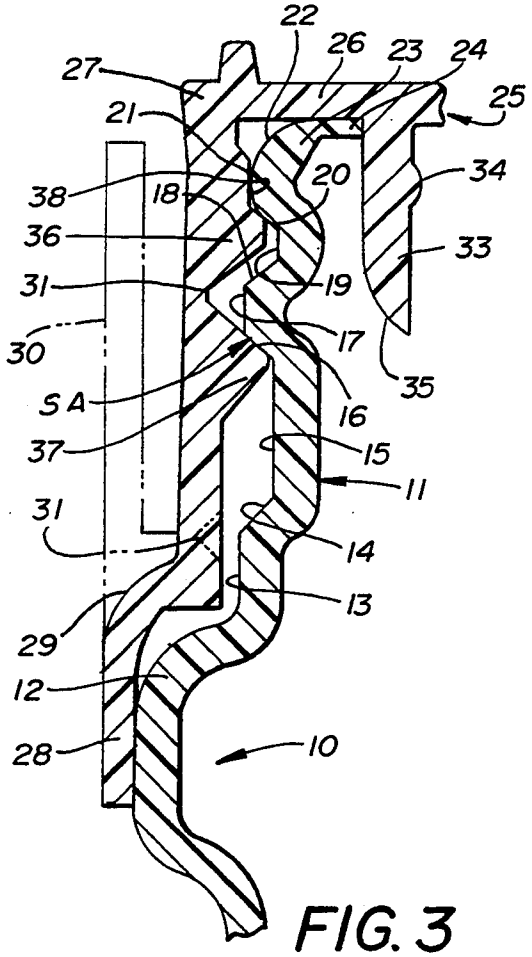


FIG. 3

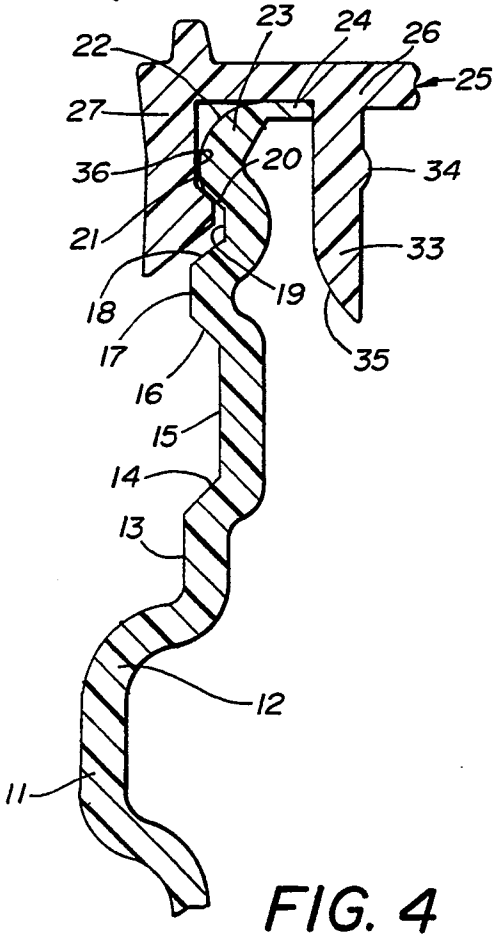


FIG. 4

NECK FINISH FOR A WIDE MOUTH CONTAINER

BACKGROUND OF THE INVENTION

1. Technical Field

This invention relates to so-called wide mouth containers and associated neck finishes that accept tamper resistant closures.

2. Description of Prior Art

Prior art devices of this type have relied on a number of cap and neck finish combinations, see for example U.S. Pat. Nos. 3,940,004, 4,438,857, 4,625,876 and 4,691,834.

In each of the above referred to patents, caps of plastic material are shown with cooperative neck finishes. The present invention provides a wide mouth neck finish that will accept tamper resistant snap cap twist off cap configurations that are provided with a tear tab that must be released and partially removed to allow the cap to be removed from the neck finish.

SUMMARY OF THE INVENTION

A neck finish on wide mouth containers for tamper resistant closures. The neck finish provides multiple sealing configurations for engagement with the closure holding same on the container. The neck finish has an upper portion of a reduced diameter in which vertically aligned ribs and grooves are formed on its outer surface for communication and registration with a tamper resistant cap.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective elevation of a cap in use with the present invention;

FIG. 2 is a perspective elevation of the cap after removal of the tear skirt;

FIG. 3 is an enlarged vertical section of the neck finish of the invention with a portion of the cap of FIG. 1 on lines 3—3 thereof; and

FIG. 4 is an enlarged vertical section of the portion of the cap in FIG. 2 on lines 4—4 thereof positioned on a portion of the neck finish of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

By referring to FIGS. 3 and 4 of the drawings, it will be seen that a container **10** such as a blow molded polyethylene or the like plastic resin material bottle is partially illustrated with a neck finish **11** formed on a cylindrical upper end with an outer surface including an upwardly and inwardly curving section **12** with a first vertical smooth surface **13** extending thereabove. An inwardly and upwardly angled section **14** extends above said first vertical smooth surface **13**. A second vertical smooth surface **15** extends inwardly thereabove, an outwardly and upwardly extending angled section **16** defines a primary sealing area. A third vertical smooth surface **17** ascends above the angled section **16** on a vertical plane with said first vertical smooth surface **13**. A second inwardly and upwardly angled section **18** extends above said third vertical smooth surface **17** and is angularly inclined towards the horizontal to a greater extent than said first inwardly and upwardly angled section **14**, a fourth vertical smooth surface **19** extends thereabove in the same vertical plane as the second vertical smooth surface **15** hereinbefore described. An outwardly and upwardly extending angled section **20** extends thereabove to a fifth vertical smooth surface **21** in the same vertical plane as said third vertical smooth surface **17**. The fifth vertical smooth surface **21** transcends into a convex inwardly curving outer surface **22** which continues into a horizontal extending flange **23** of transverse reduced diameter at **24**.

By referring to FIGS. **1–3** of the drawings, a cap **25** can be seen having a top portion **26** with a depending annular flange **27** extending from the peripheral edge thereof. An annularly outwardly offset secondary flange **28** extends from the lower portion of the annular flange **27**, the Junction below an upper portion of the annular flange **27** and the secondary flange **28** comprising an outwardly and downwardly curving section **29**.

An upstanding pull tab **30** can be seen in broken lines in FIG. **3** of the drawings and is integrally formed with the secondary annular flange **28** as to extend upwardly from the outwardly and downwardly curving section **29** thereof.

Referring now to FIG. **1**, it will be seen that a horizontal frangible tear line **31** extends circumferentially around the depending annular flange **27** substantially above the outward and downward curving section **29** from which the secondary flange **28** depends with the exception that in the area of the depending annular flange **28** adjacent the upstanding pull tab **30**. The frangible tear line **31** takes a lower position adjacent the pull tab **30** as best seen in FIG. **2** of the drawings to define a downturned secondary tab **30A**. A curving frangible line **32** extends from the second end of the horizontal frangible line **31** adjacent the pull tab **30** to the lowermost edge of the annular flange **27**.

It will be evident from the above description that by grasping the pull tab and moving it outwardly from the depending annular flange **27** will tear the portion of the depending annular flange **28** below the horizontal frangible tear line **31** including the secondary flange **28** from the cap **25** along the upper portion of the cap as seen in FIGS. **2** and **4** of the drawings.

The remaining portion of the cap, best seen in FIGS. **2** and **4** of the drawings is comprised of the top **26**, the upper portion of the annular depending flange **27** thereon extending downwardly and the secondary tab **30A** formed by the removal of the pull tab **30** with the lower portion of the secondary annular flange **28**.

Referring now to FIG. **3** of the drawings, it will be seen that when the cap **25** is engaged on the neck finish **11** of the invention, that the uppermost part of the horizontally disposed inturned flange **23** is in sealing relation with the lower surface of the top portion **26** of the cap **25** with the innermost surface of the area of reduced transverse dimension at **24** abutting a depending annular sealing flange **33** which is spaced inwardly in relation to the depending annular flange **27** of the cap **25**. An inturned annular rib **34** is formed on the inner surface of the annular sealing flange **33** for increased rigidity, with the lower outer surface **35** of the annular sealing flange **33** curved inwardly and downwardly to position and engage the cap **25** on the neck finish **11** of the container **10**.

Still referring to FIG. **3**, it will be seen that a pair of annular ribs **36** and **37** are formed on the inner surface of the depending annular flange **27** in vertically spaced relation to one another forming upper secondary sealing and lower primary sealing fastening configurations on the cap **25** and are in abutting sealing relationship to the outwardly and upwardly extending angled sections **20** and **16** respectively of the neck **11**.

The fifth smooth vertical surface **21** of the neck **11** is in abutting relationship with a registering vertical smooth surface **38** formed on the inner surface of the annular depending flange **27** thereabove said annular rib **36**. A continuous annular seal is thus formed between the respective vertical smooth surfaces **21** and **38** and the respective angular surface section **20** and the upper angular surface of the annular rib **36** as hereinbefore described. Given the foregoing arrangement, it will be seen that the frangible tear line **31** is positioned between said annular ribs **36** and **37** of the depending annular flange **27** as clearly indicated in FIG. **3** of the drawings and adjacent the lower portion of the secondary offset flange **28** indicating its relative position between the upper portion of the annular depending flange **27** and the lower secondary annular flange **28** in the area of the pull tab **30** as hereinbefore described.

It will occur to those skilled in the art that when the pull tab **30** is grasped and used to tear the tear skirt from the original cap structure **25**, the remaining cap portions seen in FIGS. **2** and **4** of the drawings still retains two fastening and sealing configurations comprising the hereinbefore described upper portion of the annular depending flange **27** with registering fifth vertical smooth surface **21** of the neck **11** and the respective upper angular surface of the rib **36** in the outwardly and upwardly extending angle section **20**.

It will thus be seen that a new and novel neck finish on a wide mouth container for use with a snap on twist off tamper indicating cap has been illustrated and described and it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention, therefore

I claim:

1. A neck finish and tamper indicating cap for a wide mouth container, said neck finish comprising a container neck having a cap receiving finish, said cap receiving finish formed with a cylindrical upper end having a first inwardly curving outer surface and a lower end having an upwardly and inwardly curving section, a first vertical smooth surface immediately thereabove, a first inwardly and upwardly angled surface thereabove, a second vertical smooth surface immediately thereabove, a first outwardly and upwardly angled outer surface immediately above said second vertical smooth surface, a third vertical smooth surface immediately above; a second inwardly and upwardly angled surface immediately above said third vertical smooth surface, a first annular groove in said outer surface formed by said first inwardly and upwardly angled surface and said first outwardly and upwardly angled outer surface, with said second vertical smooth surface therebetween, a fourth vertical smooth surface immediately above said second inwardly and upwardly angled surface, a second outwardly and upwardly angled surface immediately below said cylindrical upper end inwardly curving outer surface, a second annular groove in said cap receiving finish outer surface defined by said second inwardly and upwardly angled surface and said second outwardly and upwardly angled surface and said fourth vertical smooth surface therebetween.

2. The neck finish for a wide mouth container of claim **1** wherein said first annular groove in said cap receiving neck finish outer surface is of a known transverse width, said second annular groove in said neck finish is of a transverse width less than the known transverse width of said first angular groove in said outer surface of said cap receiving finish.

3. The neck finish for a wide mouth container of claim **1** wherein said first outwardly and upwardly angled outer surface is a primary seal for said tamper indicating cap positioned on said neck finish.

4. The neck finish of claim **1** wherein said second outwardly and upwardly angled surface in said outer surface of said neck finish is a secondary seal for said tamper indicating cap.

5. The neck finish of claim **1** wherein said first inwardly curving outer surface has an area of reduced transverse dimension for sealing engagement with said tamper indicating cap.

6. The neck finish of claim **1** wherein said respective second and fourth vertical smooth surfaces therein are in the same vertical plane, and said first and third vertical smooth surfaces of said neck finish are in the same vertical plane.

7. The neck finish of claim **6** wherein said respective second and fourth vertical smooth surfaces and said first and third vertical smooth surfaces are in horizontally spaced parallel vertical planar alignment.

8. The neck finish of claim **1** wherein said first annular groove in said outer surface and said second annular groove in said outer surface are in vertical spaced aligned relation to one another.

9. The neck finish of claim **1** wherein said cylindrical upper end of said neck finish inwardly curving outer surface defines an outer horizontal cap sealing surface and an outer vertical cap sealing surface extending from its respective curving terminal portions.

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